

## 3.0 AFFECTED ENVIRONMENT

### 3.1 GEOLOGY AND SOILS

For the purpose of including analysis of the affected environment, a brief discussion will be presented below. A more detailed discussion for the geology and soils can be found in Section 3.1 of the August 2001 DEIR/EIS.

#### 3.1.1 GEOLOGY

Orange County includes a diverse combination of mountains, hills, flatlands and shoreline. The County is located within the southern Los Angeles Basin, within the northern Peninsular Ranges Geomorphic Province. The backbone of Orange County geology is the Santa Ana Mountain Range, which extends southeast from the Puente Hills near Prado Dam across the county limits. The Santa Ana River is primarily responsible for the surface geology of the study area.

#### 3.1.2 SEISMICITY

As described in the August 2001 DEIR/DEIS, Orange County is subject to a high level of seismic activity with potentially destructive earthquakes. Six major active or potentially active fault zones are known within or near the project area (OCEMA, 1987). These fault zones include the Los Alamitos Fault, Newport-Inglewood Fault, Whittier Fault, San Andreas Fault, El Modena Fault and Peralta Hills Fault. Figure 3.1-1 shows the locations of major known faults near or within the SR-22/West Orange County Connection (SR-22/WOCC) study area.

#### 3.1.3 SOILS

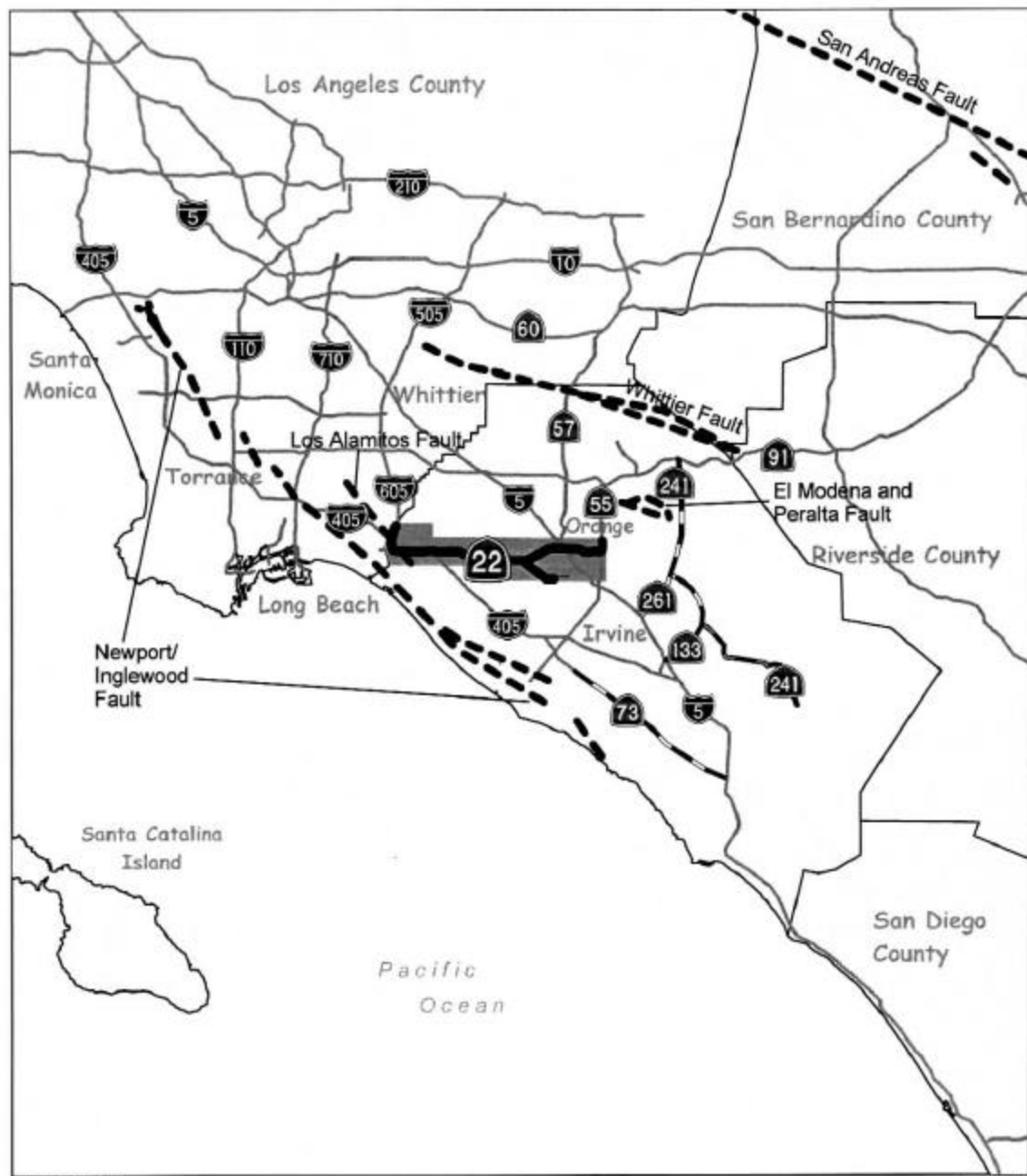
The two large soil associations in the SR-22/WOCC study area are the Hueneme-Bolsa and the Metz-San Emigdio. The Hueneme-Bolsa association extends southeast from Seal Beach to the Santa Ana River and about 16 to 19 kilometers (10 to 12 miles) inland from the coast, making up approximately 11 percent of Orange County. Plant cover for this association is comprised of annual grasses, forbs, mustard, and plants that require moisture. Elevations range from 1.5 to 107 meters (5 to 350 feet) (USDA, 1978). The Metz-San Emigdio association is located primarily on the upper floodplains from the Santa Ana Canyon area west to Buena Park and Stanton, and southwest to Garden Grove and northern Santa Ana. The plant cover is usually annual grasses and forbs. Elevations range from 3 to 460 meters (10 to 1,500 feet) (USDA, 1978). These soil associations comprise about 39 percent of all soil types in Orange County (USDA, 1978).

#### 3.1.4 LIQUEFACTION

In general, the SR-22/WOCC project study area has a high water table and is located in a region that has moderate to high susceptibility to liquefaction (USGS, *Seismic Liquefaction*, 2000). See Figure 3.1-2 for areas susceptible to liquefaction.

#### 3.1.5 EXPANSIVE SOILS

Expansive soils have grains that swell and increase in volume when water is added. This triggers cracking, slipping or sinking of residences, sidewalks and swimming pools. Much of Orange County suffers from this problem because of the clay structure of the soil (Orange County, August 1987).



Source: ESRI 1998.

**LEGEND**

- Major Roads
- Toll Roads
- Study Area
- Faults






**SR-22 / West Orange County Connection Project**  
**Faults**

Figure 3.1-1



Source: ESRI 1998.

**LEGEND**

-  Freeway
-  Study Area
-  Liquefaction Areas



**SR-22 / West Orange County Connection Project**  
**Areas Susceptible to Liquefaction**

Figure 3.1-2

<sup>1</sup> The General Plan is available at OCTA.

### 3.1.6 LANDSLIDE, EROSION, SUBSIDENCE, AND UPLIFT

The study area is located on a generally flat, landscaped terrace; therefore, there is a low potential for landslides and erosion to occur.

Subsidence and uplift are caused by forces within the earth's crust or by withdrawal or injection of fluids or solids such as oil, water, soil or rock. The proposed project study area has a very low potential for subsidence or uplift (Orange County, 1987).

### 3.1.7 SEICHES AND TSUNAMIS

The only bodies of water present in the vicinity of the proposed project study area are the small ponds and reservoirs present on golf courses and parks, which do not present a potential for seiches due to their low volume of water. In addition, The Orange County coastline is shielded to the west by the Channel Islands and to the north by Point Conception from most sources of tsunamis, thereby reducing the threat of damage (Orange County, August 1987).

### 3.1.8 MINERAL RESOURCES

There is currently no economic mineral resource extraction in operation within the study area; therefore, there is a low potential of mineral loss due to the construction of the proposed project.

### 3.1.9 PALEONTOLOGICAL RESOURCES

Soils in and around the study area are the result of alluvial deposits from sedimentary rock sources. These deposits have a low potential for paleontological resources. In addition, the project study area is not classified by the *Orange County General Plan* as an area of high paleontological sensitivity (Orange County, August 1987).<sup>2</sup>

---

<sup>2</sup> The General Plan is available at OCTA.